

Engineering Statement – Construction Permit Conditions

San Francisco Television Station KBCW Inc

KBCW(TV) San Francisco, California

Facility ID 69619

San Francisco Television Station KBCW Inc (“*ViacomCBS*”) has completed construction of its KBCW San Francisco, CA transmission facilities by making a timely Phase 9 transition from channel 45 to 28. This Statement addresses a Special Condition as well as a change in antenna model number from that authorized on the KBCW Construction Permit.¹

Special Condition

KBCW was scheduled to begin post-transition operation at Phase 9. Prior to that date, area health care facilities were notified as required by a Special Condition to the Construction Permit. Certification of the notification is available for inspection using KBCW’s on-line Public Inspection File.

Antenna Model Change

As shown in the attached data sheets, *ViacomCBS* engineers have elected to utilize a Dielectric model number of TFU-24DSC/VP-R C140 DC directional antenna in lieu of the antenna specified on the Construction Permit. There will be no change in antenna height or azimuth patterns, as detailed in the attached data sheets. Although slight increases in elevation pattern relative field values are shown, the revised radiofrequency energy calculations shown below remain less than five percent of the FCC limit.

Antenna Model Change

The constructed facility was evaluated for human exposure to radiofrequency energy using equation ten (10) from the Commission’s OET Bulletin No. 65 using a typical UHF antenna elevation pattern field value of 15 percent or less toward angles 20 degrees or more below the horizon. This study shows that the proposed facility would contribute a power density of $13.4 \mu\text{W}/\text{cm}^2$ at two meters above ground level near antenna support structure, or 3.6 percent of the FCC’s $371.3 \mu\text{W}/\text{cm}^2$ “uncontrolled/general population” exposure limit for UHF

¹ See Construction Permit file number 0000033563.

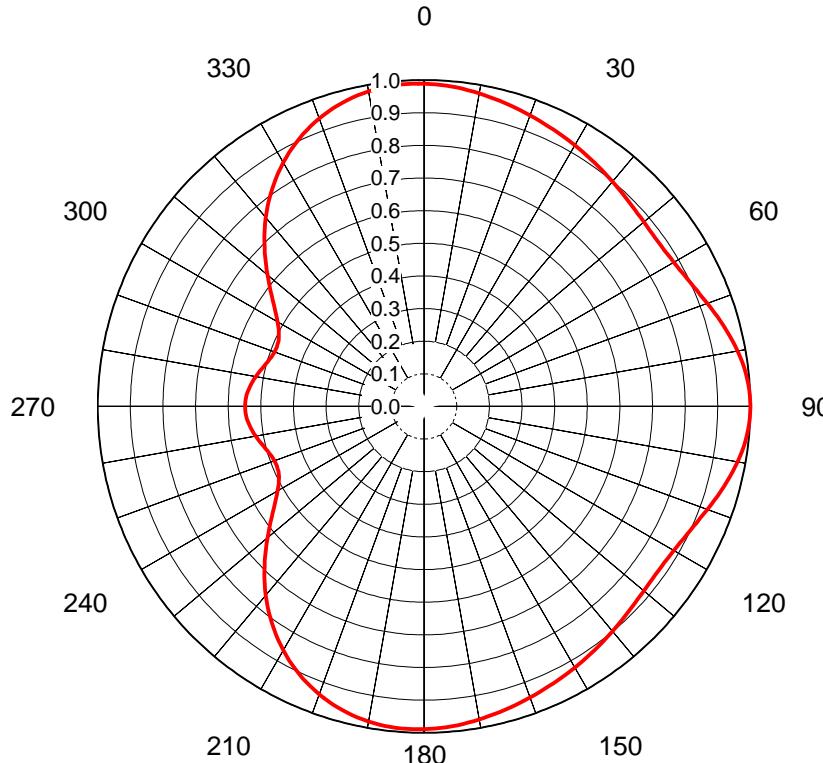
Engineering Statement – Construction Permit Conditions
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Channel 28 (557 MHz). RF power density is expected to be even lower at ground level locations away from the base of the tower, due to the increasing distance from the transmitting antenna.

According to §1.1307(b)(3), facilities at locations with multiple emitters are categorically excluded from responsibility for taking corrective action in areas where their contribution is less than five percent of the limit. Since the calculated exposure is less than five percent at all ground level areas, the impact of other possible contributors should not be a factor.

Tower access will continue to be controlled and appropriate RF exposure warning signs will continue to be posted. A site exposure policy is in effect that includes restriction of access, power reduction, or the complete shutdown of facilities when work must be performed where predicted RF levels would otherwise exceed appropriate guidelines. On-site RF exposure measurements may also be undertaken to establish the bounds of safe working areas. The applicant will coordinate exposure procedures with all pertinent stations.

Dielectric®



AZIMUTH PATTERN Horizontal Polarization

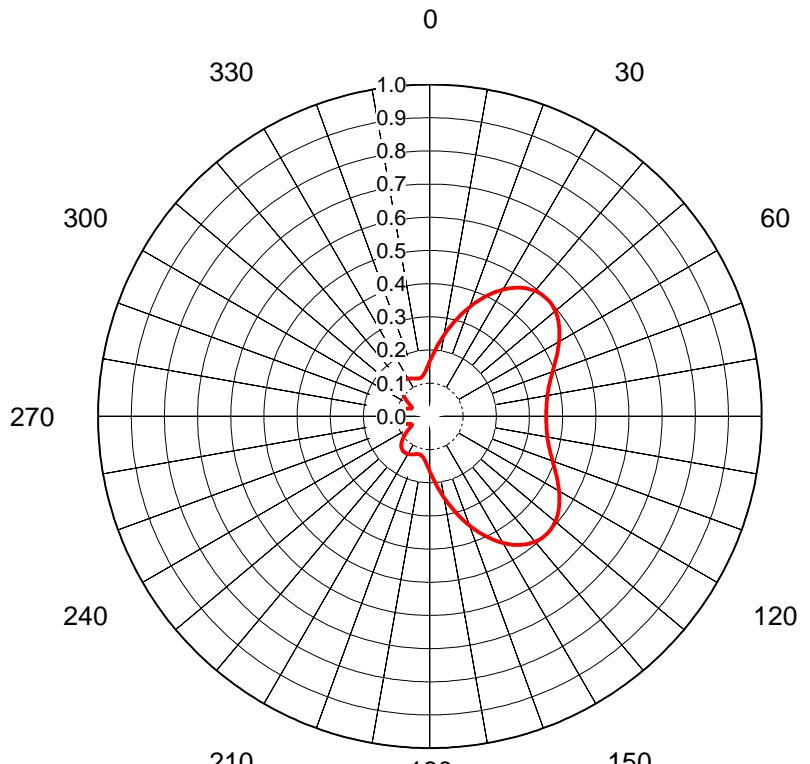
In Free Space

Proposal No.	C-70770-3
Date	19-Jul-18
Call Letters	KBCW
Channel	28
Frequency	557 MHz
Antenna Type	TFU-24DSC/VP-R C140 DC
Gain	1.4 (1.47dB)
Calculated	

Deg	Value																						
0	0.989	36	0.909	72	0.934	108	0.934	144	0.909	180	0.989	216	0.801	252	0.492	288	0.492	324	0.801				
1	0.989	37	0.907	73	0.940	109	0.929	145	0.912	181	0.990	217	0.790	253	0.495	289	0.490	325	0.812				
2	0.988	38	0.904	74	0.946	110	0.924	146	0.914	182	0.990	218	0.778	254	0.498	290	0.488	326	0.823				
3	0.987	39	0.901	75	0.951	111	0.919	147	0.917	183	0.990	219	0.767	255	0.502	291	0.487	327	0.833				
4	0.985	40	0.899	76	0.956	112	0.913	148	0.919	184	0.989	220	0.755	256	0.506	292	0.486	328	0.844				
5	0.984	41	0.897	77	0.962	113	0.909	149	0.922	185	0.989	221	0.742	257	0.511	293	0.488	329	0.853				
6	0.982	42	0.894	78	0.967	114	0.904	150	0.924	186	0.988	222	0.730	258	0.515	294	0.489	330	0.863				
7	0.980	43	0.892	79	0.971	115	0.900	151	0.927	187	0.986	223	0.717	259	0.519	295	0.492	331	0.872				
8	0.978	44	0.890	80	0.976	116	0.896	152	0.929	188	0.985	224	0.704	260	0.524	296	0.495	332	0.881				
9	0.976	45	0.888	81	0.980	117	0.892	153	0.932	189	0.983	225	0.691	261	0.528	297	0.500	333	0.889				
10	0.974	46	0.885	82	0.984	118	0.889	154	0.934	190	0.981	226	0.678	262	0.532	298	0.505	334	0.897				
11	0.972	47	0.884	83	0.988	119	0.886	155	0.937	191	0.978	227	0.665	263	0.535	299	0.512	335	0.905				
12	0.969	48	0.882	84	0.991	120	0.884	156	0.939	192	0.975	228	0.652	264	0.539	300	0.518	336	0.913				
13	0.967	49	0.880	85	0.993	121	0.882	157	0.942	193	0.972	229	0.639	265	0.542	301	0.527	337	0.920				
14	0.965	50	0.879	86	0.996	122	0.880	158	0.944	194	0.968	230	0.626	266	0.544	302	0.535	338	0.927				
15	0.962	51	0.878	87	0.997	123	0.879	159	0.947	195	0.964	231	0.614	267	0.546	303	0.545	339	0.933				
16	0.960	52	0.877	88	0.999	124	0.877	160	0.949	196	0.960	232	0.601	268	0.547	304	0.555	340	0.939				
17	0.957	53	0.877	89	0.999	125	0.877	161	0.952	197	0.955	233	0.589	269	0.548	305	0.566	341	0.945				
18	0.954	54	0.877	90	1.000	126	0.877	162	0.954	198	0.950	234	0.577	270	0.549	306	0.577	342	0.950				
19	0.952	55	0.877	91	0.999	127	0.877	163	0.957	199	0.945	235	0.566	271	0.548	307	0.589	343	0.955				
20	0.949	56	0.877	92	0.999	128	0.877	164	0.960	200	0.939	236	0.555	272	0.547	308	0.601	344	0.960				
21	0.947	57	0.879	93	0.997	129	0.878	165	0.962	201	0.933	237	0.545	273	0.546	309	0.614	345	0.964				
22	0.944	58	0.880	94	0.996	130	0.879	166	0.965	202	0.927	238	0.535	274	0.544	310	0.626	346	0.968				
23	0.942	59	0.882	95	0.993	131	0.880	167	0.967	203	0.920	239	0.527	275	0.542	311	0.639	347	0.972				
24	0.939	60	0.884	96	0.991	132	0.882	168	0.969	204	0.913	240	0.518	276	0.539	312	0.652	348	0.975				
25	0.937	61	0.886	97	0.988	133	0.884	169	0.972	205	0.905	241	0.512	277	0.535	313	0.665	349	0.978				
26	0.934	62	0.889	98	0.984	134	0.885	170	0.974	206	0.897	242	0.505	278	0.532	314	0.678	350	0.981				
27	0.932	63	0.892	99	0.980	135	0.887	171	0.976	207	0.889	243	0.500	279	0.528	315	0.691	351	0.983				
28	0.929	64	0.896	100	0.976	136	0.890	172	0.978	208	0.881	244	0.495	280	0.524	316	0.704	352	0.985				
29	0.927	65	0.900	101	0.971	137	0.892	173	0.980	209	0.872	245	0.492	281	0.519	317	0.717	353	0.986				
30	0.924	66	0.904	102	0.967	138	0.894	174	0.982	210	0.863	246	0.489	282	0.515	318	0.730	354	0.988				
31	0.922	67	0.909	103	0.962	139	0.897	175	0.984	211	0.853	247	0.488	283	0.511	319	0.742	355	0.989				
32	0.919	68	0.913	104	0.956	140	0.899	176	0.985	212	0.844	248	0.486	284	0.506	320	0.755	356	0.989				
33	0.917	69	0.919	105	0.951	141	0.901	177	0.987	213	0.833	249	0.487	285	0.502	321	0.767	357	0.990				
34	0.914	70	0.924	106	0.946	142	0.904	178	0.988	214	0.823	250	0.488	286	0.498	322	0.778	358	0.990				
35	0.912	71	0.929	107	0.940	143	0.906	179	0.989	215	0.812	251	0.490	287	0.495	323	0.790	359	0.990				

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AZIMUTH PATTERN Vertical Polarization

In Free Space

Proposal No.	C-70770-3
Date	19-Jul-18
Call Letters	KBCW
Channel	28
Frequency	557 MHz
Antenna Type	TFU-24DSC/VP-R C140 DC
Gain	2.91 (4.64dB)
	Calculated

Deg	Value																		
0	0.166	36	0.478	72	0.384	108	0.384	144	0.478	180	0.166	216	0.133	252	0.074	288	0.074	324	0.133
1	0.173	37	0.483	73	0.380	109	0.389	145	0.473	181	0.160	217	0.132	253	0.078	289	0.070	325	0.133
2	0.180	38	0.487	74	0.376	110	0.394	146	0.468	182	0.154	218	0.132	254	0.082	290	0.067	326	0.133
3	0.188	39	0.490	75	0.373	111	0.399	147	0.462	183	0.149	219	0.131	255	0.087	291	0.064	327	0.133
4	0.196	40	0.493	76	0.370	112	0.404	148	0.455	184	0.144	220	0.130	256	0.091	292	0.062	328	0.132
5	0.204	41	0.496	77	0.367	113	0.409	149	0.448	185	0.139	221	0.129	257	0.095	293	0.060	329	0.132
6	0.213	42	0.498	78	0.364	114	0.415	150	0.441	186	0.135	222	0.128	258	0.099	294	0.059	330	0.131
7	0.221	43	0.499	79	0.362	115	0.420	151	0.433	187	0.132	223	0.126	259	0.103	295	0.059	331	0.130
8	0.231	44	0.500	80	0.360	116	0.426	152	0.425	188	0.129	224	0.124	260	0.107	296	0.060	332	0.129
9	0.240	45	0.500	81	0.358	117	0.432	153	0.417	189	0.126	225	0.122	261	0.110	297	0.061	333	0.128
10	0.249	46	0.500	82	0.356	118	0.438	154	0.408	190	0.124	226	0.119	262	0.114	298	0.063	334	0.127
11	0.259	47	0.499	83	0.355	119	0.444	155	0.399	191	0.122	227	0.117	263	0.117	299	0.066	335	0.126
12	0.269	48	0.498	84	0.354	120	0.449	156	0.390	192	0.121	228	0.114	264	0.119	300	0.069	336	0.125
13	0.279	49	0.496	85	0.353	121	0.455	157	0.380	193	0.120	229	0.111	265	0.121	301	0.073	337	0.124
14	0.289	50	0.493	86	0.352	122	0.460	158	0.370	194	0.119	230	0.107	266	0.123	302	0.077	338	0.123
15	0.299	51	0.491	87	0.352	123	0.466	159	0.361	195	0.119	231	0.104	267	0.125	303	0.080	339	0.122
16	0.310	52	0.487	88	0.351	124	0.471	160	0.351	196	0.119	232	0.100	268	0.126	304	0.084	340	0.121
17	0.320	53	0.484	89	0.351	125	0.475	161	0.340	197	0.119	233	0.096	269	0.126	305	0.089	341	0.120
18	0.330	54	0.480	90	0.351	126	0.480	162	0.330	198	0.120	234	0.093	270	0.126	306	0.093	342	0.120
19	0.340	55	0.475	91	0.351	127	0.484	163	0.320	199	0.120	235	0.089	271	0.126	307	0.096	343	0.119
20	0.351	56	0.471	92	0.351	128	0.487	164	0.310	200	0.121	236	0.084	272	0.126	308	0.100	344	0.119
21	0.361	57	0.466	93	0.352	129	0.491	165	0.299	201	0.122	237	0.080	273	0.125	309	0.104	345	0.119
22	0.370	58	0.460	94	0.352	130	0.493	166	0.289	202	0.123	238	0.077	274	0.123	310	0.107	346	0.119
23	0.380	59	0.455	95	0.353	131	0.496	167	0.279	203	0.124	239	0.073	275	0.121	311	0.111	347	0.120
24	0.390	60	0.449	96	0.354	132	0.498	168	0.269	204	0.125	240	0.069	276	0.119	312	0.114	348	0.121
25	0.399	61	0.444	97	0.355	133	0.499	169	0.259	205	0.126	241	0.066	277	0.117	313	0.117	349	0.122
26	0.408	62	0.438	98	0.356	134	0.500	170	0.249	206	0.127	242	0.063	278	0.114	314	0.119	350	0.124
27	0.417	63	0.432	99	0.358	135	0.500	171	0.240	207	0.128	243	0.061	279	0.110	315	0.122	351	0.126
28	0.425	64	0.426	100	0.360	136	0.500	172	0.231	208	0.129	244	0.060	280	0.107	316	0.124	352	0.129
29	0.433	65	0.420	101	0.362	137	0.499	173	0.221	209	0.130	245	0.059	281	0.103	317	0.126	353	0.132
30	0.441	66	0.415	102	0.364	138	0.498	174	0.213	210	0.131	246	0.059	282	0.099	318	0.128	354	0.135
31	0.448	67	0.409	103	0.367	139	0.496	175	0.204	211	0.132	247	0.060	283	0.095	319	0.129	355	0.139
32	0.455	68	0.404	104	0.370	140	0.493	176	0.196	212	0.132	248	0.062	284	0.091	320	0.130	356	0.144
33	0.462	69	0.399	105	0.373	141	0.490	177	0.188	213	0.133	249	0.064	285	0.087	321	0.131	357	0.149
34	0.468	70	0.394	106	0.376	142	0.487	178	0.180	214	0.133	250	0.067	286	0.082	322	0.132	358	0.154
35	0.473	71	0.389	107	0.380	143	0.483	179	0.173	215	0.133	251	0.070	287	0.078	323	0.132	359	0.160

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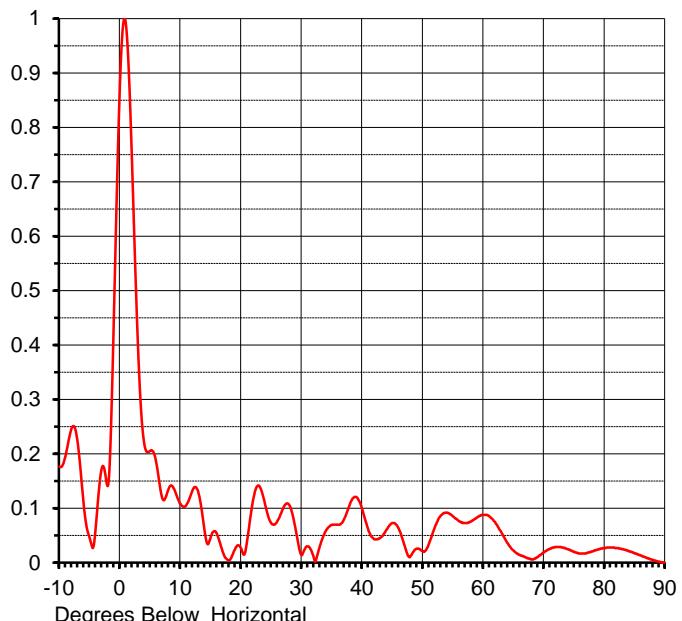
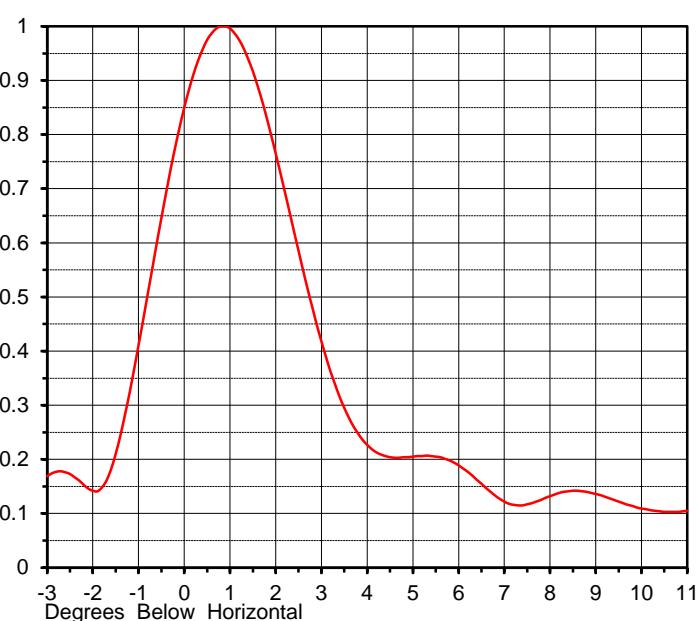
ELEVATION PATTERN

Proposal No. **C-70770-3**
 Date **19-Jul-18**
 Call Letters **KBCW**
 Channel **28**
 Frequency **557 MHz**
 Antenna Type **TFU-24DSC/VP-R C140 DC**

RMS Directivity at Main Lobe
 RMS Directivity at Horizontal

18.3 (12.62 dB)
14.2 (11.52 dB)
Calculated

Beam Tilt **0.75 deg**
 Pattern Number **24Q183075**



Angle	Field								
-10.0	0.177	10.0	0.108	30.0	0.014	50.0	0.021	70.0	0.019
-9.0	0.196	11.0	0.107	31.0	0.030	51.0	0.035	71.0	0.026
-8.0	0.247	12.0	0.134	32.0	0.009	52.0	0.066	72.0	0.029
-7.0	0.222	13.0	0.126	33.0	0.031	53.0	0.087	73.0	0.028
-6.0	0.108	14.0	0.056	34.0	0.059	54.0	0.092	74.0	0.025
-5.0	0.045	15.0	0.048	35.0	0.070	55.0	0.085	75.0	0.020
-4.0	0.066	16.0	0.053	36.0	0.070	56.0	0.076	76.0	0.017
-3.0	0.174	17.0	0.019	37.0	0.080	57.0	0.073	77.0	0.018
-2.0	0.141	18.0	0.004	38.0	0.109	58.0	0.076	78.0	0.021
-1.0	0.457	19.0	0.025	39.0	0.121	59.0	0.084	79.0	0.025
0.0	0.882	20.0	0.026	40.0	0.098	60.0	0.088	80.0	0.027
1.0	0.987	21.0	0.042	41.0	0.060	61.0	0.085	81.0	0.028
2.0	0.730	22.0	0.117	42.0	0.043	62.0	0.073	82.0	0.027
3.0	0.389	23.0	0.141	43.0	0.046	63.0	0.055	83.0	0.025
4.0	0.219	24.0	0.105	44.0	0.061	64.0	0.036	84.0	0.021
5.0	0.206	25.0	0.072	45.0	0.073	65.0	0.022	85.0	0.017
6.0	0.183	26.0	0.077	46.0	0.063	66.0	0.014	86.0	0.013
7.0	0.118	27.0	0.102	47.0	0.031	67.0	0.010	87.0	0.009
8.0	0.135	28.0	0.105	48.0	0.013	68.0	0.006	88.0	0.005
9.0	0.134	29.0	0.061	49.0	0.026	69.0	0.011	89.0	0.002
								90.0	0.000

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